August 28, 2012

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Ms. Inga Williams, AICP
Principal Planner
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18500 Murdock Circle
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Subject: Calusa Green Solid Waste Disposal Facility Site Plan Review
Hydrogeological Consulting Services
Professional Services Library RLI 2010000335
Work Order #41 – File #2012000335, HYDROLOGIST CONSULTANT

Dear Ms. Williams:

Cardno ENTRIX is pleased to submit this memorandum summarizing the August 22, 2012 conference call to discuss geologic and hydrogeologic technical elements relating to the site plan review application.

A conference call was convened with County staff, the applicant, representatives of the applicant, and Cardno ENTRIX personnel to discuss Progressive Water Resources' August 17, 2012 response to Charlotte County's Request for Additional Information and other additional data submitted for the proposed Calusa Green Solid Waste Disposal facility in Charlotte County, Florida.

The conversation began with a discussion of recharge to the aquifers underlying the project site. Data provided by the applicant show that, in the vicinity of the project site, water levels have the potential for downward movement of groundwater between aquifers. Water levels in the surficial aquifer system (SAS) are higher than water levels in the intermediate aquifer system (IAS) and the IAS water levels are higher than the water levels within the Floridan Aquifer System (FAS). In addition, the applicant supplied water level data from Southwest Florida Water Management District ROMP monitoring wells 12 and 13.

The data from ROMP 12 (based on median water levels) showed that there was an upward potential for groundwater movement and the data provided from ROMP 13 showed a downward potential for groundwater movement. As discussed in the conversation, the rate of movement between aquifers is more than a function of groundwater potential and is dictated by the aquifer hydraulic properties and other physical factors such as the thickness of the confining units. It is Cardno ENTRIX's position that the likelihood of recharge from the SAS to the FAS is minimal. However, the potential for movement between the SAS and IAS is unknown based on the submitted data. The IAS is a source of supply that is utilized more than the FAS in the project area.

The applicant's representatives indicated that *Smart Charlotte 2050 Comprehensive Plan* (Comprehensive Plan) *Future Land Use Element Map #6: Prime Aquifer Recharge Areas,* which shows that the facility is located within the recharge area identified in the northeastern portion of the County, relates to recharge to the FAS, and does not relate to recharge to other aquifers. However, it was noted that in assessing the site's recharge impacts, other zones should also be evaluated. The intent of the Comprehensive Plan's *Municipal Solid Waste (MSW) Objective 2.3 - Solid Waste Facility Siting*: "To site solid waste collection and disposal facilities in a manner that protects the natural and community resources of the County" is to protect all appropriate resources.

While discussing the siting of the landfill within the identified Prime Aquifer Recharge Area, it was noted that AQR Policy 1.1.1 Prime Aquifer Recharge Protection requires that *"The County shall limit impervious surface area within areas of prime aquifer recharge (FLUM Series Map #6) to ten percent, thereby allowing for the greatest amount of water to infiltrate the ground"*. The concept of impervious area and the engineering design of the surface water management system were discussed.

The applicant's representatives indicated that the vegetated surface of the area covering the geosynthetic liner did not constitute an impervious surface and that the surface water management system would retain all rainwater run-off from up to a 100-year, 72-hour storm. The onsite storm water retained from rainfall events would infiltrate via onsite retention areas back in to the SAS at near one hundred percent of the water retained. The retention of the storm water would increase recharge by preventing water, which would normally run off the site and be lost to recharge, to be infiltrated back into the aquifer system.

County staff indicated that in addition to the provision in the Comprehensive Plan of no greater than ten percent impervious surface to prevent restrictions to water infiltration, the provision of no greater than ten percent impervious surface was also to limit the areal extent of development within the recharge area. Cardno ENTRIX concurs with the applicant that based on the surface water management design and on a net volume of recharge, the landfill will not restrict recharge to the groundwater system and will likely increase recharge. However, Cardno ENTRIX concurs with County staff that the portion of the site overlain by the geosynthetic liner, which is an impervious material, will exceed ten percent impervious coverage by area.

Discussion and concerns relating to recharge included 1) the quantity of recharge will be at least as much and very likely more as a result of the project. 2) The quality of the water that is being recharged will depend on the system for management and control of leachate - this is an issue of engineering the leachate management system and the surface water management system to regulate water quality. 3) The safety of the system is dependent on a monitoring program that should be designed specifically according to the site's hydrogeologic characteristics. The monitoring program should be one that will identify any issues of contamination and allow sufficient time to react before contaminants leave the site. The important items to focus on in the monitoring program are the aquifer characteristics that control how fast water will enter and travel in the SAS and the connection to and movement within the uppermost part of the IAS.

As noted in the applicant's response to the County's Request for Additional Information, additional data will be collect as required by the Florida Department of Environmental Protection (FDEP) as part of the permit application process. Analyses of these data will be necessary to assure the FDEP that the project protects the natural and community resources of the County.

Cardno ENTRIX appreciates the opportunity to provide geologic and hydrogeologic services on your behalf. Should you have any comments or questions, or require additional information, please do not hesitate to contact Lloyd Horvath or Gary Susdorf.

Sincerely,

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LEH/GS/gng

cc: Dan Quick – Charlotte County

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